

Air Force

SBIR Advantage

Offering a brief look at the vital research and development contributions made by the Small Business Innovation Research (SBIR) Program in direct support of the Air Force mission.

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*Celebrating 100 Years of Air & Space
Innovation by Small Business*

Air Force SBIR Update

by Stephen Guilfoos Air Force SBIR Program Manager



Taxes – A Choice or a Fact of Life

Everyone in their personal life pays taxes

– income, property, sales, and other taxes.

Now you find your programs paying SBIR/STTR taxes. Are SBIR/STTR taxes avoidable? Any loopholes to reduce these taxes? The only loophole would be a waiver granted by SAF/AQ. But that carries a proviso – the bottom line amount of taxes the Air Force must spend on SBIR/STTR does not change.

Don't Waiver

If someone is lucky enough to obtain a waiver, then everyone else must make up the dollar amount of their waiver. The Air Force taxes all the RDT&E program elements based upon their rate of extramural spending. In other words, of all the Air Force dollars being spent on outside contracted work for RDT&E, 2.5% goes to SBIR, 0.15% goes to STTR, and 0.01% is applied to our administrative costs. Note that STTR will double to 0.3% in FY 2004.

Regardless of how much you pay in taxes, you are always asking, "What value am I receiving for my tax dollars?"

Value

What value does the battlefield commander receive from the Smart Bomb Rack that doubles the number of weapons that can be carried on a fighter aircraft? What value is there to be able to connect with all Air Mobility Command aircraft simultaneously? What value is there to be able to reduce the vibration loads on small satellites when they are launched into orbit? All of these are examples of SBIR technologies in use by the Air Force today!

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SBIR Tech Issues

Tech Issues is intended for personnel directly involved in the operation and support of the AF SBIR program.

Topic Submission Module Improvements

The Topic Submission Module (TSM) was originally created as a platform to facilitate the submission and development of SBIR ideas and topics. The TSM platform allows key players to track and adjust these ideas and topics from initial concepts to a completed form. The system helps fulfill all requirements for DDR&E approval leading to inclusion of a topic in a particular SBIR solicitation.

The TSM is separated into two distinct areas, the first is the "Topic Idea" file that is open and available on-line continually. This file permits PEO/DAC idea

submissions to be entered for AFRL TD review and or development. The Topic Idea file also allows the TDs a place to enter potential technology projects that may be useful to the PEO/DAC community. The other file is the "Formal Topic" area. This area is used by PEO/DACs, ALCs, TCs, and TDs to identify those ideas or topics that have been selected and prioritized for consideration for a particular SBIR solicitation.

We have continually made improvements/updates to this module to make it more efficient, effective,

and user friendly. Recently, we made the following changes that we think will facilitate the development of ideas and/or topics:

1. In order to more effectively identify requirements for an idea or topic, we incorporated items from the popular "Helpful Hints for Writing SBIR Topics" pamphlet into the module. This action was taken to create a helpful reference document for idea and topic authors as they enter or edit materials, the ideas and topics.

2. We also added "Info" buttons. These buttons contain helpful instructions to individuals when they originally add an idea or topic and to those individuals identified as POCs (Sponsor or TD) when they edit their topic.

These latest improvements should give individuals a "roadmap" on what information is necessary and the format required. This should help reduce the number of DDR&E topics rejections and enhance sponsor POC and TD POC interface capability.

For additional information contact Lenman Moore at (937) 656-9061

SBIR Facts & Figures

The data represented in the chart below shows numbers of topics, proposals and awards from the SBIR 2001.1 and 2002.1 Phase I solicitations.

Command	Topics 01.1	Proposals 01.1	Awards 01.1	Topics 02.1	Proposals 02.1	Awards 02.1
HE	16	136	41	14	179	23
IF	34	268	52	18	412	41
ML	26	244	41	23	261	41
MN	10	98	21	24	221	29
DE	11	76	19	20	153	49
VS	36	246	61	36	378	75
PR	14	169	26	14	200	32
PRO	12	104	17	4	82	10
SN	31	185	52	32	223	59
VA	15	152	17	15	157	25

Source: Air Force SBIR/STTR Database

AF SBIR Transition Impact

Smart Bomb Rack Multiplies Strike Capability



Air Force Requirements

Initially the Air Force required a “Smart Bomb Rack” that could double the number of “smart” bombs that an aircraft could carry and deploy. Smart bombs use signals from Global Positioning System (GPS) satellites to hit targets with pinpoint accuracy. This smart rack technology offers a significant increase in Air Force smart weapons capability with increased survivability and cost savings. This requirement was later expanded to development of the next generation of Smart Rack technology called Smart Weapons ARray Modular Ejector Rack (SWARMER) designed for multiple carriage of miniature munitions.

SBIR Technology

In 1989, the AFRL Munitions Directorate working with M. Technologies, a SBIR small business, developed a “Smart Bomb Rack”, the BRU-57, for the F-16 aircraft. The BRU-57 Smart Rack allowed the F-16 to carry two smart weapons per aircraft station where previously they could only carry one smart weapon per station. This doubled the aircraft loadout for 1000 pound-class smart weapons such as the Joint Standoff Weapon (JSOW), Joint Direct Attack Munition (JDAM), and Wind Corrected Munitions Dispenser (WCMD). This increased loadout was accomplished through M. Technologies’ patented electronics design that allowed for the multiplexing of digital data communications between the aircraft and the weapons.

The next generation of Smart Rack technology, SWARMER, focuses on the multiple carriage of miniature munitions. SWARMER has been prototyped and integrated with the F-22, B-1B, B-2, F-15, B-52H, and the Joint Strike Fighter (JSF) through the Smart Weapons ARray Modular Ejector Rack (SWARMER) SBIR Program also managed by the Munitions Directorate.

- SBIR technology used for “Smart” bomb rack, doubles F-16 strike capability
- Smart rack provides 100% increase in loadout of 1000 pound-class smart weapons per aircraft station
- Provides force multiplier while increasing survivability and lowering cost per sortie
- Smart rack provides 100% increase in loadout of 1000 pound-class smart weapons per aircraft station, and both variants of the Joint Strike Fighter

Air Force Transition Payoff

Smart Bomb Rack

Before Smart Rack, an aircraft could only communicate with one weapon per station. The doubled aircraft loadout provided by Smart Rack is a true force multiplier. It offers the power, control, and digital data multiplexing to carry multiple smart weapons on one aircraft station. It cut the number of sorties required in half, and thus significantly increased the safety and survivability of U.S. aircraft and pilots. Substantial cost savings resulted from the reduced number of sorties. Aircraft fuel, maintenance, and logistics costs were also significantly reduced.

SWARMER

With SWARMER the Munitions Directorate is exploring technology that would allow multiple carriage of miniature munitions or four Small Smart Bombs at one Mil Std 1760 station. The main benefit to MMC is in risks and cost reduction. The directorate is currently working on integration issues covering multiple aircraft such as the F-22, B-1, B-2, B-52, F-15 and both of the strike fighter contractors.

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Air Force SBIR Update

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Value comes not only in dollars, but also in the ability to complete your missions.

But what control do you have on what value you receive – better yet, what control do you have over how your tax dollars are spent?

You are already aware that your “control” of SBIR taxes consists of generating topics based on your technology needs. Not only do you generate topics, but you also have the opportunity to evaluate proposals from small businesses.

Leveraging Your Tax Dollars

What you may not be aware of is how the Air Force Research Laboratory (AFRL) leverages your taxed dollars. On many SBIR projects, the AFRL adds additional AFRL “mission” money directly onto the SBIR Phase I and II contracts. As you can see in the table, the AFRL has added over \$45M over the past three years. This money goes directly to the development of technology to meet the needs of the Air Force acquisition community.

Behind the scenes, all of the AFRL Technical POC work hours are provided by

the AFRL at no additional costs to the taxpayers. On average the Technical POC spends approximately 225 hours in supporting a topic from inception all the way from topic preparation through to Phase II contract close out. If any government testing is involved, it adds another 40 to 100 hours. This equates to between 43,000 and 49,000 AFRL technical man-hours provided to the acquisition community on a yearly basis.

Hidden Leverage - Administrative Support Hours

Each AFRL TD provides both a SBIR manager and an administrative assistant, contracting officers and financial management personnel to work your SBIR topic. This represents over 45,000 additional man-hours provided annually at no charge to the taxpayers in the acquisition community. Included in these hours is the record keeping and report generation for Small Business Administration and Congress.

Outreach to Small Businesses

The administrative portion of your tax dollars fund various outreach efforts to the small businesses. We travel to multiple federal and state-sponsored SBIR conferences and workshops to speak and advise small businesses. We provide brochures on SBIR and STTR as well as success stories to the small business community. We fund visits by the technical POCs to the small businesses as part of their oversight responsibilities.

Technology Transition

The ultimate performance measure is the number of SBIR topics that result in technologies that are in operational use today. Because of the high risk involved with innovation, should the Air Force expect more than industrial investors? Should the Air Force expect more than the 5% angel investors expect? The laboratory alone cannot transition the resultant

SBIR technologies. Both the acquisition system program offices (SPOs) and the prime contractors need to be involved and to take advantage of the opportunities the SBIR program affords them.

Conclusion

Your tax dollars have a strong heritage of providing value for your tax dollar investment. Besides having a formal say on the topic focus and proposal evaluations, you receive over 80,000 hours of leverage manpower from AFRL. Together we can continue to plus upon your investment to provide those technologies needed by the Air Force to fulfill our war-fighting mission.

SBIR Phase I & II Contracts

	FY 2000	FY 2001	FY 2002
Phase I	\$816,009	\$469,192	\$279,060
Phase II ...	\$13,661,845	\$15,693,700	\$15,239,918
Totals	\$14,477,854	\$16,162,892	\$15,518,978



**Air Force
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Science and Technology for Tomorrow's Air & Space Force



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The goal of the Air Force SBIR Program is to serve the technology needs of Air Force warfighters. It accomplishes its mission as part of the Air Force Research Laboratory's (AFRL) integrated research and development (R&D) team. AFRL's mission is leading the discovery, development, and integration of affordable warfighting technologies for our aerospace forces.

SBIR Advantage is published quarterly by the Air Force SBIR Program office. This publication offers an overview of AF SBIR issues and information. The purpose of *SBIR Advantage* is to provide Air Force, DoD, and other government leadership with additional insight into the vital contributions made by the SBIR program to Air Force R&D.

SBIR Advantage is available online at: www.afri.af.mil/sbir

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